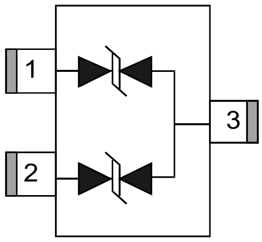
Dual Line CAN Bus Protector

The NUP2105L has been designed to protect the CAN transceiver in high−speed and fault tolerant networks from ESD and other harmful transient voltage events. This device provides bidirectional protection for each data line with a single compact SOT−23 package, giving the system designer a low cost option for improving system reliability and meeting stringent EMI requirements.



Features

- 350 W Peak Power Dissipation per Line (8 x 20sec Waveform)
- Low Reverse Leakage Current (< 100 nA)
- Low Capacitance High−Speed CAN Data Rates
- IEC Compatibility: − IEC 61000−4−2 (ESD): Level 4
  − IEC 61000−4−4 (EFT): 40 A – 5/50ns
  − IEC 61000−4−5 (Lighting) 8.0 A (8/20μs)
- ISO 7637−1, Nonrepetitive EMI Surge Pulse 2, 9.5 A (1 x 50μs)
- ISO 7637−3, Repetitive Electrical Fast Transient (EFT) EMI Surge Pulses, 50 A (5 x 50 ns)
- Flammability Rating UL 94 V−0
- AEC−Q101 Qualified and PPAP Capable
- SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- Pb−Free Packages are Available*

Applications

- Industrial Control Networks
  Smart Distribution Systems (SDS®)
  DeviceNet™
- Automotive Networks
  Low and High−Speed CAN
  Fault Tolerant CAN

MAXIMUM RATINGS (T_J = 25°C, unless otherwise specified)

Symbol	Rating	Value	Unit
PPK	Peak Power Dissipation 8 x 20 μs Double Exponential Waveform (Note 1)	350	W
T_J	Operating Junction Temperature Range	−55 to 150	°C
T_J	Storage Temperature Range	−55 to 150	°C
T_L	Lead Solder Temperature (10 s)	260	°C
ESD	Human Body model (HBM) Machine Model (MM) IEC 61000－4－2 Specification (Contact)	16 400 30	kV V kV

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{RWM}	Reverse Working Voltage	(Note 2)	24	–	–	V
V_{BR}	Breakdown Voltage	I_T = 1 mA (Note 3)	26.2	–	32	V
I_R	Reverse Leakage Current	V_{RWM}= 24 V	–	15	100	nA
V_C	Clamping Voltage	I_{PP} = 5 A (8 x 20μs Waveform) (Note 4)	–	–	40	V
V_C	Clamping Voltage	I_{PP} = 8 A (8 x 20μs Waveform) (Note 4)	–	–	44	V
I_{PP}	Maximum Peak Pulse Current	8 x 20μs Waveform (Note 4)	–	–	8.0	A
CJ	Capacitance	V_R = 0 V, f = 1 MHz (Line to GND)	–	–	30	pF

1. Non−repetitive current pulse per Figure 1.
2. TVS devices are normally selected according to the working peak reverse voltage (V_{RWM}), which should be equal or greater than the DC or continuous peak operating voltage level.
3. V_{BR} is measured at pulse test current I_T.
4. Pulse waveform per Figure 1.

TYPICAL PERFORMANCE CURVES

(T_J = 25°C unless otherwise noted)

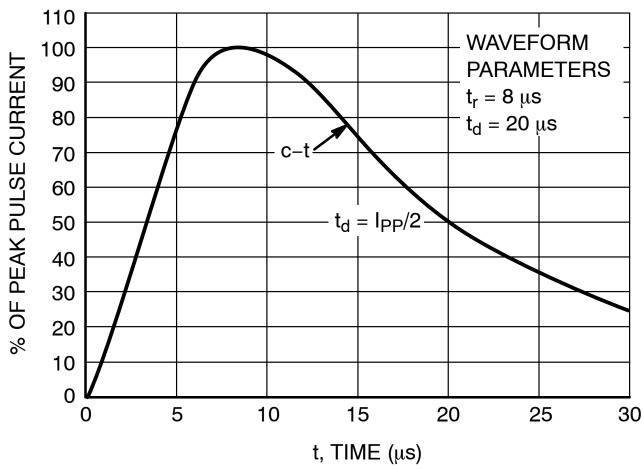


Figure 1. Pulse Waveform, 8×20 μs

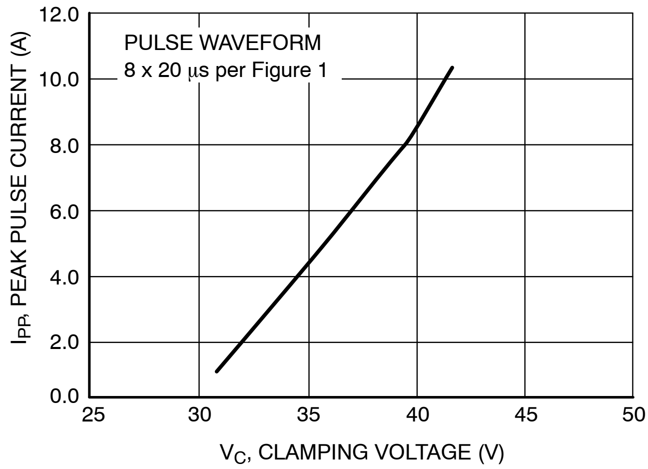


Figure 2. Clamping Voltage vs Peak Pulse Current

TYPICAL PERFORMANCE CURVES

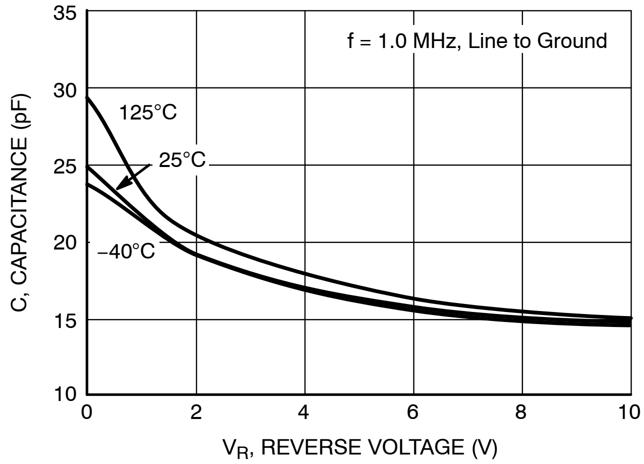


Figure 3. Typical Junction Capacitance vs Reverse Voltage

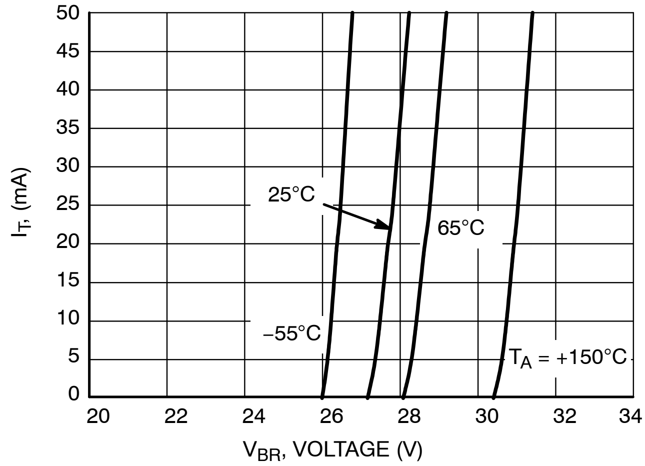


Figure 4. V_{BR} versus I_T Characteristics

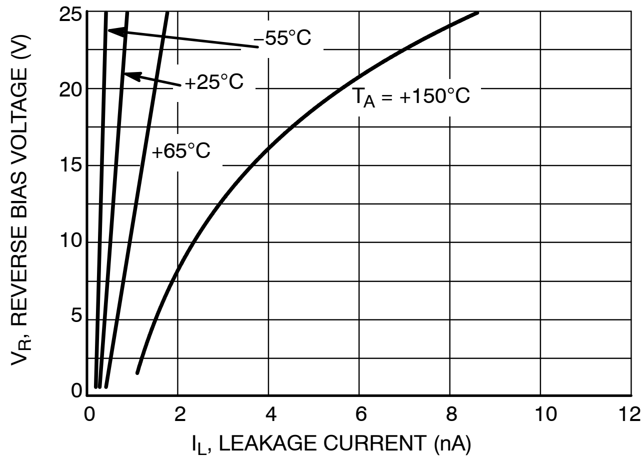


Figure 5. I_R versus Temperature Characteristics

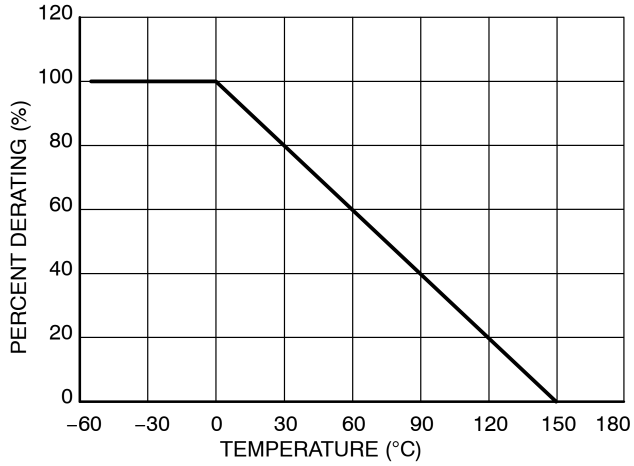
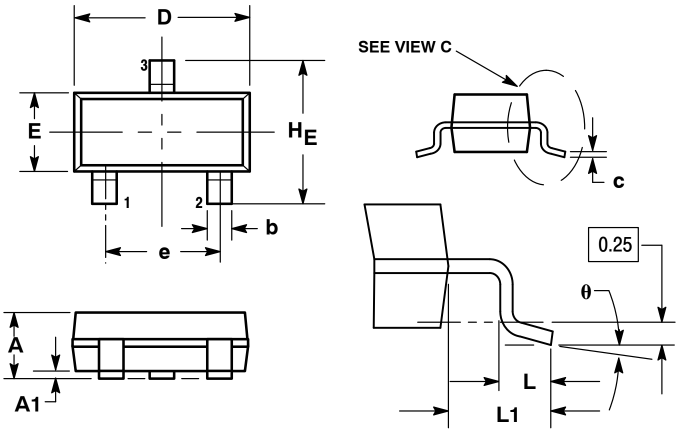


Figure 6. Temperature Power Dissipation Derating

Outline Drawing – SOT-23



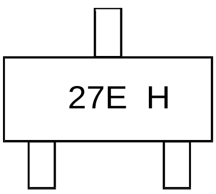
VIEW C

DIM	MILLIMETERS MIN	MILLIMETERS NOM	MILLIMETERS MAX	INCHES MIN	INCHES NOM	INCHES MAX
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
c	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.081
L	0.10	0.20	0.30	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
H_E	2.10	2.40	2.64	0.083	0.094	0.104
θ	0°	---	10°	0°	---	10°

STYLE 27:
PIN 1. CATHODE
2. CATHODE
3. CATHODE

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW NUP2105L	SOT-23	3000	Tape and reel

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